Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

1. (canceled)

2. (currently amended) <u>A method for down-converting and de-spreading a received spread spectrum signal, comprising the steps of:</u>

<u>   (1)   receiving the spread spectrum signal having a center frequency that is above baseband; and</u>

<u>   (2)   sampling the received spread spectrum signal according to a control signal resulting in a de-spread baseband signal, wherein said control signal includes a spreading code corresponding to said received spread spectrum signal, said control signal having a center frequency that is selected so as to down-convert said received spread spectrum signal to baseband during said sampling step,</u> ~~The method of claim 1,~~ wherein step (2) comprises ~~the steps of:~~

(a)   sampling the received spread spectrum signal at a rate that is a sub-harmonic of the received spread spectrum signal, resulting in under-samples; and

(b)   storing said under-samples in a storage module, wherein successive undersamples form the de-spread baseband signal.

3. (original) The method of claim 2, wherein step (a) comprises the step of operating a switch according to said control signal.

4. (original) The method of claim 2, wherein step (b) comprises the step of charging a capacitor with said undersamples.

5-7. (cancelled)

8. (currently amended) The method of claim [[1]]2, wherein said spreading code is a PN code.

9. (previously presented) A method for down-converting and de-spreading a received spread spectrum signal, comprising:

    (1)   receiving the spread spectrum signal; and

    (2)   sampling the received spread spectrum signal according to a control signal resulting in a de-spread baseband signal, wherein said control signal includes a spreading code corresponding to said received spread spectrum signal;

    wherein said step (2) comprises

    (a)   generating an oscillating signal;

    (b)   generating a spreading code;

    (c)   modulating said oscillating signal according to said spreading code, resulting in a spread oscillating signal; and

    (d)   triggering a pulse generator according to said spread oscillating signal to generate said control signal.

10-12. (cancelled)

13. (previously amended) An apparatus for down-converting and de-spreading a spread spectrum signal, comprising:

     (1)   a spreading code generator to generate a spreading-code; and

     (2)   a frequency down-conversion module coupled to said spreading code generator, comprising:

     (a)   a switch controlled by a control signal to undersample said spread spectrum signal, resulting in an undersample, wherein said control signal carries said spreading-code and has a center frequency determined so as to down-convert said spread spectrum signal to a lower frequency signal; and

     (b)   a storage device coupled to said switch to store said undersample, wherein successive under-samples form said de-spread baseband signal.

14. (previously presented) An apparatus for down-converting and de-spreading a spread spectrum signal, comprising:

     (1)   a spreading code generator to generate a spreading-code; and

     (2)   a frequency down-conversion module coupled to said spreading code generator, including

     (a)   a switch controlled by a control signal to undersample said spread spectrum signal, resulting in an undersample, wherein said control signal carries said spreading-code; and

     (b)   a storage device coupled to said switch to store said undersample, wherein successive under-samples form said de-spread baseband signal; and

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(3)   a pulse generator coupled between said spreading code generator and said frequency down-conversion module, comprising a means for generating said control signal having a plurality of pulses based on said spreading code.

15. (previously presented) The apparatus of claim 13, wherein said storage device is one of a capacitor and an inductor.

16. (previously presented) An apparatus for down-converting and de-spreading a spread spectrum signal, comprising:

(1)   an oscillator for generating an oscillating signal;

(2)   a spreading code generator for generating a spreading code;

(3)   a modulator coupled to said oscillator and said spreading code generator for generating a spread oscillating signal using said oscillating signal and said spreading code;

(4)   a pulse generator coupled to said modulator, for generating a control signal using said spread oscillating signal; and

(5)   a frequency translation module coupled to said pulse generator, comprising:

(a)   a switch controlled by said control signal to undersample said spread spectrum signal; and

(b)   a storage device coupled to said switch to store undersamples from step (5a), wherein successive under-samples form a de-spread baseband signal.

17. (currently amended) The method of claim [[1]] 2, wherein said center frequency of said control signal is approximately equal to said center frequency of said received spread spectrum signal.

18. (currently amended) The method of claim [[1]] 2, wherein said center frequency of said control signal is approximately a sub-harmonic of said center frequency of said received spread spectrum signal.

19. (currently amended)   The method of claim [[1]]2, wherein said center frequency of said control signal is offset from a sub-harmonic of said center frequency of said received spread spectrum signal.

20. (currently amended) The method of claim [[1]] 2, wherein said step (2) comprises the steps of:

(a)   generating an oscillating signal having said center frequency that is determined to down-convert said received spread spectrum signal to baseband during said sampling step;

(b)   generating a spreading code; and

(c)   modulating said oscillating signal according to said spreading code, resulting in a spread oscillating signal.

21. (currently amended) A method for down-converting and de-spreading a received spread spectrum signal, comprising the steps of:

(1)   receiving the spread spectrum signal having a center frequency that is above baseband;

(2)   generating a control signal having a center frequency that is selected to down-convert said received spread spectrum signal to baseband, and said control signal also including a spreading code corresponding to said received spread spectrum signal; and

(3)   under-sampling the received spread spectrum signal according to said control signal so as to down-convert and de-spread said spread spectrum signal.

22. (currently amended) The method of claim 21, wherein said under-sampling step includes the step of under-sampling the received spread spectrum signal according to said control signal so as to simultaneously down-convert and de-spread said spread spectrum signal.